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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/594,292

09/25/2006

Kuniaki Okada

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EDWARDS ANGELL PALMER & DODGE LLP

P.O. BOX 55874

BOSTON, MA 02205

EXAMINER

BLEVINS, JERRY M

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,292	Applicant(s) OKADA ET AL.	
	Examiner JERRY BLEVINS	Art Unit 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 11-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/25/06, 2/5/07, 6/2/08, 7/29/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by US 2001/0020991 to Kubo et al.

Regarding claim 1, Kubo teaches a display panel (Figures 10, 11A, 11B), comprising: a backlight (58) that supplies light used in displaying; a pixel-formed panel including a plurality of pixels arranged in matrix (Figure 11A), a light shielding section (60) that shields light emitted from the backlight, and an aperture section via which light emitted from the backlight transmits (corresponding to region of Figure 10 denoted by diagonally dashed arrows); and a microlens array including a plurality of micro-lenses (59) each converging, to the aperture section light emitted from the backlight (Figure 10), the microlens having a width, in a direction parallel to a display surface of the display panel, equal to a pixel pitch in the direction (Figures 10, 11A), and the microlens being arranged to cause light that comes from the backlight and is incident on a top section of the microlens to transmit while maintaining substantially same intensity and direction (paragraph 160 and Figure 10).

Regarding claim 2, Kubo teaches that the microlens includes, at the top section of the microlens, a flat section that is substantially parallel to the display surface of the display panel (Figure 10).

Regarding claim 4, Kubo teaches that each of the plurality of pixels includes at least one sub-pixel, arranged vertically with respect to the direction (Figure 11A), each including (a) a reflecting section (50) that reflects light coming from a surrounding area of the display panel and (b) a transmitting section (51) via which light, emitted from the backlight and having passed through the aperture section, transmits.

Regarding claim 9, Kubo teaches that the microlens array includes a plurality of micro-lenses that are provided for respective ones of the at least one sub-pixel, and that the microlens array causes incident light to be converged in a plurality of directions (Figure 10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of JP 09127309 to Mikami et al.

Regarding claim 3, Kubo teaches the limitations of the base claim 1. Kubo does not teach an adhesive layer provided on a backlight-side surface of the micro-lens array and provided to be in contact with the top section of the microlens by a predetermined width in the direction, the adhesive layer made of a material that causes a smaller difference in refractive index between the material and the microlens array than a difference in refractive index between air and the microlens. Mikami teaches an adhesive layer provided on a backlight-side surface of a micro-lens array and provided to be in contact with the top section of the microlens by a predetermined width (abstract and Figure 8), the adhesive layer made of a material that causes a smaller difference in refractive index between the material and the microlens array than a difference in refractive index between air and the microlens (since both the microlens and the adhesive layer invariably have a refractive index greater than 1.0, the refractive index of air). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the adhesive layer of Mikami in the panel of Kubo. The motivation would have been to improve adherence of the microlens to the backlight.

Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of JP 09049925 to Miura et al.

Regarding claim 5, Kubo teaches the limitations of the base claim 1. Kubo does not teach that the angle at which light emitted from the backlight is spread is less than or equal to 2.5 times a tolerable angle of the microlens. Miura teaches that an angle at which light emitted from a backlight is spread is less than or equal to 2.5 times a tolerable angle of a microlens (paragraph 39). It would have been obvious to one of

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ordinary skill in the art at the time of the invention to include the spread angle of less than or equal to 2.5 times the tolerable angle of the microlens, as taught by Miura, for the display panel of Kubo. The motivation would have been to improve the picture quality.

Regarding claim 6, Kubo teaches the limitations of the base claim 4. Kubo does not teach that a section of the microlens is at least 0.2 times and not more than the transmitting section of each of the at least one sub-pixels. Miura teaches that a section of a microlens is at least 0.2 times and not more than the transmitting section of each of the at least one sub-pixels (paragraph 12). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the microlens of Kubo with the above teachings of Miura. The motivation would have been to improve luminescence (paragraph 12).

Regarding claim 7, Kubo in view of Miura renders obvious the limitations of the base claim 6. Kubo also teaches that the microlens includes, at the top section of the microlens, a flat section that is substantially parallel to the display surface of the display panel (Figure 10), and that the transmitting section of each of the at least one sub-pixels is 45% or below of the at least one sub-pixel (Figures 10 and 11A).

Regarding claim 8, Kubo teaches that the direction is a row or column in which a distance between transmitting sections of adjacent ones of the plurality of pixels arranged in the matrix is longer (Figure 10). Kubo does not teach that the microlens array includes a plurality of lenticular lenses, arranged vertically, that cause incident light to be converged in the direction. Miura teaches a plurality of lenticular lenses,

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arranged vertically, that cause incident light to be converged in the direction (Figures 1 and 3-6). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the lenticular lenses of Miura as the microlens array of Kubo. The motivation would have been to widen the visual field angle (abstract).

Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of JP 06130205 to Yamazaki et al.

Regarding claims 10 and 16, Kubo teaches a method for manufacturing a display panel (Figures 10, 11A, 11B), comprising: a backlight (58) that supplies light used in displaying; a pixel-formed panel including a plurality of pixels arranged in matrix (Figure 11A), a light shielding section (60) that shields light emitted from the backlight, and an aperture section via which light emitted from the backlight transmits (corresponding to region of Figure 10 denoted by diagonally dashed arrows); and a microlens array including a plurality of micro-lenses (59) each converging, to the aperture section light emitted from the backlight (Figure 10), the microlens having a width, in a direction parallel to a display surface of the display panel, equal to a pixel pitch in the direction (Figures 10, 11A), and the microlens being arranged to cause light that comes from the backlight and is incident on a top section of the microlens to transmit while maintaining substantially same intensity and direction (paragraph 160 and Figure 10). Kubo also teaches forming a photo-polymerizing polymer layer on a surface of the pixel-formed panel (paragraph 44). Kubo does not teach hardening a section of the photo-polymerizing polymer layer by use of light that transmits through the aperture section by use of parallel light during exposure and eliminating an unhardened portion of the

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photo-polymerizing layer so as to form the microlens. Yamazaki teaches hardening a section of a photo-polymerizing polymer layer by use of light that transmits through an aperture section by use of parallel light during exposure and eliminating an unhardened portion of the photo-polymerizing layer so as to form a microlens (abstract and Figures 1-5). It would have been obvious to perform the methodology of Yamazaki in order to form the microlens of Kubo. The motivation would have been to reduce the deformation of the microlens (abstract).

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of Yamazaki as applied to claim 10 above, and further in view of Mikami.

Regarding claim 15, Kubo in view of Yamazaki renders obvious the limitations of the base claim 1. Kubo does not teach an adhesive layer provided on a backlight-side surface of the micro-lens array and provided to be in contact with the top section of the microlens by a predetermined width in the direction, the adhesive layer made of a material that causes a smaller difference in refractive index between the material and the microlens array than a difference in refractive index between air and the microlens, the area of the adhesive layer in contact with a top section of the microlens being at least 0.2 times and not more than the aperture section. Mikami teaches an adhesive layer provided on a backlight-side surface of a micro-lens array and provided to be in contact with the top section of the microlens by a predetermined width (abstract and Figure 8), the adhesive layer made of a material that causes a smaller difference in refractive index between the material and the microlens array than a difference in refractive index between air and the microlens (since both the microlens and the

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adhesive layer invariably have a refractive index greater than 1.0, the refractive index of air), the area of the adhesive layer in contact with a top section of the microlens being at least 0.2 times and not more than the aperture section (abstract and Figure 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the adhesive layer of Mikami in the panel of Kubo. The motivation would have been to improve adherence of the microlens to the backlight.

Allowable Subject Matter

Claims 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 11, Kubo, alone or in combination with the prior art, fails to disclose or render obvious that a layer thickness of the photo-polymerizing polymer layer is controlled to form the microlens in such a way that a width of the microlens is equal to a pixel pitch in the direction.

Regarding claim 12, Kubo, alone or in combination with the prior art, fails to disclose or render obvious that a layer thickness of the photo-polymerizing polymer layer is controlled in such a way that a fixed amount of exposure is performed with respect to a section of the photo-polymerizing polymer layer so that a microlens having a flat section is formed at a top section of the microlens.

Claims 13 and 14 depend from claim 12.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JERRY BLEVINS whose telephone number is (571)272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jerry M Blevins/
Patent Examiner, Art Unit 2883

/Frank G Font/
Supervisory Patent Examiner, Art Unit 2883

FGF/jmb
09/24/2008